DETAILED ACTION

1. The Amendment filed June 13, 2011 in response to the Office Action of February 11, 2011 is acknowledged and has been entered. Claims 49-54 have been amended and are currently being examined.

Drawings

2. The drawings were received on 06/13/2011. These drawings are accepted.

New Grounds of Rejection

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 49-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 49 recites the limitation "based on the established level of expression similarity" in lines 12-13. There is insufficient antecedent basis for this limitation in the claim as the antecedent portion of the claim does not refer to establishing the level of expression similarity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohlmann et al. (Genes, Chromosomes, & Cancer 2003 37: 396-405, previously cited) in view of Schoch et al. (PNAS July 23, 2002, 99(15): 10,008-10,013, previously cited).

Kohlmann et al. teach that accurate sub-classification of leukemia and the identification of prognostic determinants are essential to guide therapy and improve patient outcome. Kohlmann et al. teach that pre-therapeutic assessment depends on a combination of different methods. See abstract.

Kohlmann et al. teach that prognostically relevant subtypes of acute myeloid leukemia (AML) have been established including the karyotypes: 1) t(8;21); 2) inv(16)(p13q22); and 3)

t(15;17). See abstract, p. 396-1st col., and Table 1. Kohlmann et al. et al. teach performing Affymetrix GeneChip analysis using U95Av2 and U133A GeneChips to determine the gene expression patterns of 65 AML patients with said karotypes. See abstract, Table 1 and p. 397. Kohlmann et al. teach comparing and classifying the patients' gene expression patterns to classify the samples into the aforementioned prognostic karyotype classes. See p. 397-401, Tables 1 and 2, and Fig. 1.

Kohlmann et al. teach that the expression of the genes CACNA2D2, CD81, TRH, MYH11, ARHGAP4, CBFA2T1, and POU4F1 and, which are part clusters #9, #12, and #13 of the instant application, were determined as part of the comparison and classification of the samples into the prognostic AML subtypes. See Table 2 and Fig. 1. Kohlmann et al. teach that the 24 genes of Table 2 were the most informative genes for sub-classification of the four AML subtypes. See p. 398-1st col. Kohlmann et al. teach that POU4F1, CBFA2T1, TRH, and CACNA2D2 (all members of the instantly claimed cluster #13) are useful for predication of the t(8;21) positive AML. See p. 398, Table 2 and Fig. 1.

Kohlmann et al. teach as set forth above, but does not teach determining the expression of a fifth gene from cluster #13.

Schoch et al. teach that a favorable outcome is observed for patients with acute myeloid leukemia (AML) under current treatment regimens with the following karyotypes: 1) t(8;21 (q22;q22); 2) inv(16)(p13q22); and 3) t(15;17)(q22;q11-12). See p. 10,008-1st col. Schoch et al. teach performing Affymetrix GeneChip analysis to determine the gene expression patterns of 37 AML patients with said karotypes. See p. 10,008-10,009. Schoch et al. teach comparing and classifying the patients' gene expression patterns to classify the samples into the aforementioned

prognostic karyotype classes. See p. 10,009-10,011, Figs. 1-3 and Tables 1 and 2. Schoch et al. teach that the expression of the genes PTGDS, MYH11, ARHGAP4, ADRA2C, CBFA2T1, DKFZP564K0822, POU4F1 and TGFBI, which are part clusters #9, #12, and #13 of the instant application, were determined as part of the comparison and classification of the samples into the prognostic AML subtypes. See Table 2.

Schoch et al. teach that the expression of ADRA2C (GenBank accesion no. J03853) and DKFZP564K0822 (GenBank accesion no. W25986) are useful in classification of the t(8;21) sub-class. See p. 10,011-1st col. Table 2 and Fig. 3.

It would It would have been *prima facie* obvious at the time the invention was made to combine the teachings Kohlmann et al. and Schoch et al. and determine the expression of the AML classifier genes taught by the combined references, like POU4F1, CBFA2T1, TRH, CACNA2D2, and ADRA2C, to identify the AML prognostic sub-class in a patient, like t(8;21), because Kohlmann et al. teach that accurate sub-classification of leukemia and the identification of prognostic determinants are essential to guide therapy and improve patient' outcome and that pre-therapeutic assessment depends on a combination of different methods and Schoch et al. teach that a favorable outcome is observed for patients with acute myeloid leukemia (AML) under current treatment regimens with the following karyotypes: 1) t(8;21 (q22;q22); 2) inv(16)(p13q22); and 3) t(15;17)(q22;q11-12. One of skill in the art would have been motivated to analyze the combine genes of Kohlmann et al. and Schoch et al. to provide the optimal classification of a patient into the appropriate sub-group for prognosis for the optimal treatment of said patient.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the colored aspects of Figures 1, 3-10 and 13 as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

It is noted that color photographs and color drawings are not accepted unless a petition filed under 37 CFR 1.84(a)(2) is granted. Any such petition must be accompanied by the appropriate fee set forth in 37 CFR 1.17(h), three sets of color drawings or color photographs, as appropriate, and, unless already present, an amendment to include the following language as the first paragraph of the brief description of the drawings section of the specification:

> The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

Color photographs will be accepted if the conditions for accepting color drawings and black and white photographs have been satisfied. See 37 CFR 1.84(b)(2).

6. All other objections and rejections recited in Office Action of February 11, 2011 are withdrawn in view of Applicants' amendments and/or arguements.

7. No claims allowed.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J. Reddig whose telephone number is (571) 272-9031. The examiner can normally be reached on M-F 8:30 a.m.-5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Misook Yu can be reached on (571) 272-0839. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Peter J Reddig/
Primary Examiner, Art Unit 1642